

Virtual Heliospheric Observatory General Analysis Package (VHOGAP) User Manual

Author: Kathryn Rash
Email: Kathryn.Rash@nasa.gov

Introduction

VHOGAP is a free, platform independent, general analysis tool written in the Interactive Data Language (IDL) that is capable of being extended to allow third party reading routines and plug-in features. The VHO data query utility is integrated into the application, enabling VHOGAP to download data files from the distributed data repositories for data analysis.

System Requirements

VHOGAP is available for the following platforms:

- Windows
- Linux
- Mac OS X
- Unix operating systems

Software Requirements

The IDL Virtual Machine (VM) must be installed on the user's machine. The IDL VM can be downloaded from the following web site:

<http://www.rsinc.com/download/chooseplatform.asp?urlProductCode=13>

The user must install the *wget* utility unless their computer operating system is Windows, Sun Solaris, or Mac OS X. The VHOGAP downloadable package contains *wget* executables for these three operating systems. *Wget* documentation and software can be found at:

<http://www.gnu.org/software/wget/>

Running VHOGAP

Unix

Currently, VHOGAP must be installed in the user's home directory or one of its subdirectories. To start VHOGAP, open an X11 supported shell terminal and type in the full path to the IDL executable, followed by a space. Next type "-vm=" and immediately put in the full path to the `vhogap__v*.sav` file. The `vhogap__v*.sav` file is located in the main VHOGAP folder called "vho_folder". For example:

```
/usr/local/rsi/idl_6.1/bin/idl -vm=/home/krash/vho_folder/vhogap__v0.sav
```

Windows

Currently, VHOGAP must be installed in the user's home directory or one of its subdirectories. To start VHOGAP double click on the IDL VM icon where it was installed. A "pick file" graphical user interface (GUI) will appear, and the user should select the `vhogap__v*.sav` file. The `vhogap__v*.sav` file is located in the main VHOGAP folder called "vho_folder".

Extending VHOGAP

Adding External Reading Routines

Directions on how to add external, reading routines can be found in the file called `EXTERNAL_READING_ROUTINE_GUIDELINES` located in the `vho_folder` directory of the downloadable VHOGAP package.

Adding Plug-in features

Directions on how to add plug-in features can be found in the file called `PLUGIN_GUIDELINES` located in the `vho_folder` directory of the downloadable VHOGAP package.

Getting Help

Online documentation about the VHOGAP utilities is available at:

http://vho.nasa.gov/vhoGap/vhogap_help.html

Reading Routine Widget

Spacecraft: Allows selection of a spacecraft from a drop list. If **OTHER** is selected, this means the user would like to use an external reading routine. The data files must already be present on the user's machine, since the data files are considered third party data. The external reading routine must follow the guidelines listed in the file `EXTERNAL_READING_ROUTINE_GUIDELINES` located in the `who_folder` directory. When **OTHER** is selected the **Select External Reading Routine** widget will appear.

Select External Reading Routine Widget

Spacecraft Name: Enter the name of the spacecraft.

Reading Routine Name: Enter the name of the external reading routine.

Browse: This option brings up the computer operating system's native *pick file* graphical user interface to allow the user to choose the external reading routine. After selecting the reading routine, both the **Reading Routine Name** and **Full Directory Path to Routine** text boxes will be properly filled.

Full Directory Path to Routine: Enter the full directory name of where the external reading routine is located so VHOGAP can find it.

Ok: Sets the reading routine name and its directory location and then the widget closes.

Cancel: Nothing on the widget is saved and the widget closes.

Get Info: Identifies what instruments a spacecraft contains

Instrument: This feature only appears if there are specific reading routines available for individual instruments on a spacecraft. For example, the Instrument widget is not present when Helios1 and Helios2 are selected, but it appears when the WIND spacecraft is selected. Only instruments on the selected spacecraft are listed in the drop list.

Start: Enter the start time of the data to be analyzed. The date label to the right

of the text box will change to the same value entered in the text box once the *Return* key is pressed.

End: Enter the end time of the data to be analyzed. The date label to the right of the text box will change to the same value entered in the text box once the *Return* key is pressed.

Ok: When this button is pressed, VHOGAP searches for the desired data files in the default or chosen data storage directory. If the Spacecraft selected is not **OTHER** and the files cannot be found, VHOGAP will call the VHO query utility and download the needed files to either the default or chosen data storage directory. After finding the files, VHOGAP will call the specified data reading routine and the reading routine widget will close.

Cancel: Closes the reading routine widget and no data files are read.

Advanced: This option allows advanced users to choose where they would like the data storage to be located for the current VHOGAP session. The default data directory is *vho_folder/vho_data/*.

Advanced Settings Widget

Data Directory Text Box: The user can manually enter the full path to their desired data storage location on their computer.

Browse: This option brings up the computer operating system's native *pick file* graphical user interface to allow the user to choose the desired data storage directory.

Default: This button resets the data storage directory back to the default, which is *vho_folder/vho_data*.

Ok: Sets the data storage directory to the full path entered in the text box and then exits.

Cancel: When clicked, the Advanced Settings Widget closes and the changes in the widget are not executed.

Import Only: This button is not available if the Spacecraft selected is **OTHER**. This feature allows the user to run the VHO data query service to download data files meeting their spacecraft, instrument, and time criteria. This option does not call a reading routine or any analysis procedures.

Selection of Variables Widget

Available Variables: Allows multiple selections of data fields from a widget list. To select more than one data field hold down the *Control* key and click on the desired data fields to be analyzed. Next, click on the “>>” button to add the selected variable to the **Selected Variables** list.

Selected Variables: Allows multiple selections of data fields from a widget list. To select more than one data field hold down the *Control* key and click on the desired data fields to be analyzed. To remove any data fields from the list, click on the “<<” button to remove the selected variable from the **Selected Variables** list and add it to the **Available Variables** widget list. The order of the data fields on the **Selected Variables** list is the top-down order of how the data fields will appear in the panels of the VHOGAP plot. To quickly change the order, select a data field to be moved and use the buttons to the right to move the data field. Below are the button descriptions:

Top: Moves the selected data field to the top of the widget list.

Up: Switches the position of the selected data field with the data field just above it.

Down: Switches the position of the selected data field with the data field just below it.

Bottom: Moves the selected data field to the bottom of the widget list.

Save Combination: Saves the selected data field combination in a file named by the user, which will be stored in *who_folder/who_setup*. The user can restore this combination later by pressing the **Restore Combination** button.

Restore Combination: Restores a combination of selected data fields from a file stored in *who_folder/setup*.

Main VHOGAP widget

File Menu Bar

Read Again: See **Reading Routine Widget**. (Ctrl + R)

Select Variables: See **Selection of Variables Widget**. (Ctrl + V)

Export:

Variables to a File: Exports the data structure variable to a file located in *vho_folder/vho_setup*.

GIF File: Saves the current VHOGAP main plot to a user named GIF file located in *vho_folder/vho_setup*.

EPS File: Saves the current VHOGAP main plot to a user named EPS file located in *vho_folder/vho_setup*.

Download To...: Imports data using the VHO query service utility. This feature is the same as the **Reading Routine Widget** when the **Import Only** button is pressed. The pop up widget that appears is very similar to the **Reading Routine Widget** and its child widget, **Advanced Settings**. Please refer to these widgets for further instruction.

Print: Prints the current plot from the local printer connected to the user's machine.

UNIX/Linux/MacOSX

These operating system users will have to set up their printer preferences initially. Below are the instructions:

- In the *Output Format* widget panel select the *Printer Specific* checkbox.
- Click *Install...* on the Print widget.
- Click *Add Printer...* on the Printer Installation widget.
- Click *Define New Port...* on the Add Printer widget. In the *Edit Port* text field identify the printer and a print command that will be used. For example, if the printer's name is *fooPrinter* one could define the port as: *fooPrinter="lpr"*
- Click *Add-Replace* on the Ports widget and then click *Dismiss*.
- On the Add Printer widget, select the printer device that best describes the printer being set up. Next, select the port definition that matches the printer device. Once a printer device and port have been selected click on *Add Selected*. To close the Add Printer widget click on *Dismiss*.
- If the Printer Installation widget is still open click on *Dismiss* to close it.
- If the preferred printer is not listed in the *Printer* text field, click on *Options...* and select the printer from the list and click *Ok*.
- Click *Ok* on the Print widget and the print request will be sent.

Windows

The first time the user prints a plot they will have to configure their settings. Here are the steps:

- From the main VHOGAP plot select *File -> Print*
- Click OK after to print the plot. This will cause a PrintFile Default settings popup window to appear. Click on *Settings...*
- Check the box labeled *Quit when handled command line*. Next click on *Save*.

If the user does not wish to configure the PrintFile Default settings, they will simply have to click on *Exit* in the pop up window after each print job to make the window disappear.

****NOTES****

- The ability to set a printer to landscape mode is printer-driver dependent. Some printers may not support this functionality and require the use of a system native print setup dialog (not IDL) to set the orientation of the print job. To avoid this problem, the VHOGAP determines automatically whether to print in landscape or portrait. If the Y axis of the plot is longer than the X axis it will print in portrait layout, otherwise a landscape layout will be used.
- To ensure successful printing set the VHOGAP selected printer equal to the default printer selected on the user's computer.

Quit: Quits the VHOGAP program.

View Menu Bar

Zoom In: Re-plots the selected data fields with only the data between the left and right cursor. (Ctrl + I)

Zoom Out:

Previous: Re-plots the previous plot prior to the last zoom in/out action. (Ctrl + O)

Double Interval: Zooms out of the current plot by 50%. (Ctrl + 2)

Whole Period: Returns the plot to its initial x-axis range.
(Ctrl + W)

Hide/Show Scroll View Window: Hides or Shows the Scroll View Window located to the right of the plot when displayed. (Ctrl + H)

Tools Menu Bar

Averages: Lists the average data values for the selected data fields currently plotted.

Plug-ins: Brings up a pop up widget listing the available plug-in widgets located the *who_folder/who_setup* directory. (Ctrl + A)

To add a plug-in to VHOGAP see the file
PLUGIN_GUIDELINES located in the *who_folder* directory.

***Note in order to view the plug-in html help pages, the user must have a web browser installed on their machine.

Settings Menu Bar

General Settings

General Preferences: Sets the plot layout preferences. (Ctrl + G)

Set Panels: Sets the individual plot panel layout. (Ctrl + S)

Restore Settings: Restores a set of preferences previously saved in *who_folder/who_setup*.

Save Settings: Saves the current preferences to a user named file to be located in the directory *who_folder/who_setup*.

Show/Hide Positions: Show/Hide the position labels at the bottom of the plot window.

Set Range

X Range: Set the time interval range of the data to be plotted. The selected time range may not be outside the initial data analysis time range. Also, the Number of Days text box value accepts decimal values.

Y Range: Allows the user to set the y-axis display preferences.

Scale Y Range to Time Interval: Allows the user to scale the Y range to the time interval. (Ctrl + Y)

Clear Cache: Clears the data files located in the directory
vho_folder/vho_data.

Help Menu Bar

Program Information: Provides information about the currently selected spacecraft, location of the data file that is being analyzed, and general information about VHOGAP.

Help: Launches a web browser to view the VHOGAP help pages located on the VHO server.

Update: Checks if there are recent updates to the VHOGAP program or any of its plug-ins. If any updates found are more recent than the user's current copy, VHOGAP prompts him/her with a list of new updates. The user can then select what files they would like to update and VHOGAP downloads the updates and exits. If the user updated the main VHOGAP executable, *vhogap__v*.sav*, then he/she will have to re-start VHOGAP with the new version's file name.